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Equal Opportunity in Employment and Services

TO: Venison Processors

FROM: Andrea L. Grondahl, DVM
State Meat and Poultry Inspection Director

DATE: July 30, 2008

RE: Lead Fragments in Venison

As most of you are aware, some recent studies in North Dakota and other Midwestern states have found lead fragments in venison from deer shot with lead ammunition. There is currently no evidence linking venison consumption to lead poisoning in humans. However, the amount of lead found in some venison samples suggests that lead poisoning could potentially occur in people who consume venison shot with lead ammunition.

Meat processors play an important public health role in venison processing and the "Sportsmen Against Hunger" donation program. There is a high likelihood that any deer shot with a firearm using lead ammunition will contain lead particles. Lead is a neurotoxin, meaning it affects the brain and the rest of the central nervous system. The risk depends on how much lead is consumed, and frequency of exposure; limiting the total amount of lead exposure reduces the risk of harm. Lead can have harmful effects on human bodies and brains at levels below that which would cause any noticeable signs of sickness. Pregnant women and children 6 and younger are especially vulnerable to lead exposure.

Preliminary research indicates that lead bullets or shot may disintegrate upon impact, extensively spreading small lead particles far from the bullet's path. The lead particles may be too small to see without very close inspection of the meat. In addition, it is possible that lead particles are spread through the meat during processing and grinding. Therefore the following recommendations should be followed to limit the amount of lead found in ground deer or deer sausage.

1. **Try and determine the path of the bullet and if the bullet contacted any bone.** One recent peer-reviewed study in Europe of 10 red deer and 10 wild boars taken by hunters indicated that when the bullet contacted the vertebrae resulted in a larger extent of lead contamination. This study also found elevated lead levels in meat measured from 10 to 15 centimeters (about 4-6 inches) from the bullet path. In meat from 15 to 25 centimeters (6-10 inches) from the wound channel, about half the animals still had a detectable lead level.

2. **Trim a generous distance away from the bullet wound channel and discard any meat that is bruised, discolored or contains hair, dirt, bone fragments or grass.** Studies conducted to date have found lead in venison even though most processors usually trim away visibly damaged tissue. Therefore, consider trimming beyond what has been common practice. You may need to discard complete legs, shoulders, or backstrap if there is evidence of an extensive wound and/or contact with bone. Most lead particles in venison are too small to be seen or felt. It may not be possible to determine if there is lead contamination in a piece of venison by looking at it.

3. **Use care when selecting venison for grinding.**
   A recent Minnesota study determined that ground product had a much higher rate of metal contamination (26%) than did Not Ground Product (2%). More research needs to be done to determine cause and effect relationships but this might suggest that certain meat closer to the wound channel, because of its appearance, is more likely to be used for trim and ground products. When in doubt discard venison or cut it into chops to limit the amount of lead entering the grinder.

4. **Periodically check grinders for lead fragments.** The grinding process will create additional risks no matter what type of meat or other product is involved. USDA has determined ground beef to be a riskier meat product because if bacteria is present on the surface of one or more pieces of meat it will be distributed throughout the batch when ground. Because lead is a soft metal, it can be ground along with venison, spreading lead contamination through an entire batch. If lead still remains in venison to be ground, the sooner it is found and removed, the less meat that will be contaminated. Taking a few minutes to pull the grinder plate to examine for lead buildup and then rinsing them with hot water will reduce lead contamination. If there is evidence of large amounts of lead contamination on the grinder plate, you may need to discard the venison that was ground since the previous time the grinder plate was cleaned. To minimize the amount of product that could be potentially discarded, check the grinder at least once per hour, or between each batch.

5. **Avoid or minimize batching of multiple deer to avoid cross-contamination.** As discussed above, lead contamination is similar to bacterial contamination as it

would only take one carcass with lead to contaminate several others during grinding. While it may not be possible to process single deer, using smaller batch sizes will also limit potential lead cross contamination.

6. **Develop Standard Operating Procedures (SOP's) for all employees to follow.** The SOP's should address limiting lead contamination by trimming, inspecting venison going into the grinder, and periodic checking and cleaning grinder plates and knives. A written SOP will ensure that employees understand and use practices to limit lead in ground venison and deer sausage.
   **A sample SOP developed by NDSU is enclosed*

7. **Post information or otherwise inform your customers about steps being taken to limit lead contamination.** This may also be important in explaining the yield or amount of meat being returned to the customer if excessive trimming is required to limit possible lead contamination.
   ***A ND Department of Health fact sheet is enclosed. You may make copies of this document for your customers or contact the Department of Health for additional copies*

Additional Information:

North Dakota Department of Health
Phone Number: (701) 328-2372
Website: www.ndhealth.gov/lead/venison

North Dakota Game and Fish Department
Phone Number: (701) 328-6300
Website: http://gf.nd.gov/

North Dakota State University
Phone Number: (701) 231-8975
Website: http://www.ag.ndsu.edu/pubs/yf/foods/hunting/wildgame.htm